A PROGRAM FOR IMPROVING MANAGEMENT AND RESEARCH OF FISHERIES IN THE SOUTHEAST REGION



--- D R A F T ---

SOUTHEAST/YAKUTAT SALMON FISHERIES

Project Bluebook – 2004

Alaska Department of Fish and Game Division of Commercial Fisheries Southeast Region

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TABLE OF CONTENTS

LIST OF TABLES	iii
INTRODUCTION	1
Overview of Southeast Alaska Commercial Fisheries	1
Management of Southeast Alaska Salmon Fisheries	2
PROPOSED PROJECTS	3
A. Salmon Escapement Monitoring	5
Project A.1. McDonald Lake DIDSON Escapement Estimation (sonar)	
Project B.2. Crescent Lake Sockeye Salmon Escapement Estimation	6
Project B.3. Sockeye Salmon Lake Stock Assessment	7
Project A.4. Chilkat River Inseason Escapement Monitoring	
Project A.5. Hugh Smith Weir Upgrade	8
Project A.6. Coho Salmon Escapement Surveys	9
Project A.7. Early Taku Coho Salmon Assessment	9
B. Catch and Escapement Sampling/Run Reconstruction	
Project B.1. Regionwide Port Sampling	10
C. Salmon Fishery Management	11
Project C.1. Assistant Troll Fishery Management Biologist	11
Project C.2. Southeast Alaska Troll Chinook Salmon Management	11
D. Management Support	
Project D.1. Salmon and Herring Management Vessel	12

LIST OF TABLES

		Page
Table 1.	Summary of proposed projects and estimated costs (thousands of dollars).	4

INTRODUCTION

Overview of Southeast Alaska Commercial Fisheries

The Southeast Alaska/Yakutat Region, stretching south from Cape Suckling to the Canadian border at Dixon Entrance, is one of the most productive areas in the world for five species of Pacific salmon — Chinook, sockeye, coho, pink, and chum salmon. The region is home to approximately 3,000 salmon-producing streams, and is divided into two net registration areas. Registration Area A, the Southeast Alaska area, extends from Dixon Entrance to Cape Fairweather. The Southeast Alaska area is divided into 16 regulatory districts, and salmon are commercially harvested with purse seines, drift gillnets, and floating fish traps (which are restricted to the waters of the Annette Islands Fishery Reserve). In the Yakutat area (Area D), which extends from Cape Fairweather to Cape Suckling, salmon are taken with set gillnet gear. The Southeast Alaska/Yakutat area is the only area of the state with a commercial salmon troll fishery; the fishery occurs in both state waters and in federal waters of the Exclusive Economic Zone east of the longitude of Cape Suckling.

Commercial utilization of salmon in the region began in the late 1870s. Until the early 1900s sockeye salmon was the primary species harvested. Pink salmon began to dominate the harvest in the early 1900s and comprised 52% to 90% of the region's total annual salmon harvest between 1991 and 2002. Commercial salmon harvests in the region peaked in the late 1930s and early 1940s and declined to historical low levels in the 1950s through the early 1970s. Since the mid-1970s the region's salmon production has increased, with record harvests of pink salmon (1999), chum (1996), coho (1994), and sockeye salmon (1993) occurring during the last decade.

According to the Commercial Fisheries Entry Commission, from 1992 to 2001 an average of 417 purse seine, 482 drift gillnet, 170 set gillnet, 961 power troll, and 1,480 hand troll limited entry permits were renewed annually and could have fished. The actual number of permits fished varies because of preseason expectations of fish price, run forecasts, and other factors. Fish ticket information indicates an average of 2,155 permit holders annually reported landings during this ten-year period, including 370 purse seine, 444 drift gillnet, 141 set gillnet, 767 power troll, and 433 hand troll permits.

Total commercial salmon harvests in Southeast Alaska during the last 10 years have ranged from 39.6 million to 97.6 million fish (median of 64 million fish), while exvessel values have ranged from \$50 million (in 2002) to \$126 million (in 1994).

The commercial purse seine fishery normally accounts for between 70% and 90% of the number of salmon harvested in Southeast Alaska's commercial salmon fisheries. The traditional fishery is allowed by regulation in portions of 13 regulatory districts, as well as in a number of hatchery terminal harvest areas. Pink salmon, almost all of wild-stock origin, are the primary species targeted by the seine fleet and management actions are based primarily on inseason assessments of the abundance of pink salmon. Hatchery production of chum salmon has contributed to higher harvests of this species in purse seine fisheries since the early 1990s, with the majority of the harvests occurring in hatchery terminal areas.

The drift gillnet fishery normally accounts for 5 to 10% of the total commercial salmon harvest in the region. Traditional drift gillnet fisheries are allowed by regulation in five districts in inside waters of Southeast Alaska as well as in several hatchery terminal areas in the region. Drift gillnet fisheries primarily target sockeye, chum, and pink salmon during the summer months (mid-June through mid-August) and coho and fall chum salmon during the fall (late August through late September or early October).

The Yakutat area set gillnet fishery typically accounts for approximately 1% of the entire region's commercial salmon harvest. Yakutat set gillnet fisheries occur, with few exceptions, in or near the mouths of rivers that empty into the Gulf of Alaska. The fisheries target sockeye salmon during the summer and coho salmon during the fall, with minor and generally incidental harvests of other salmon species.

The commercial troll fishery primarily harvests Chinook and coho salmon. Historically the commercial troll fishery harvested 85% to 90% of all the Chinook salmon taken in Southeast Alaska. Since 1980, that percentage has declined due to harvest ceilings imposed as part of the Pacific Salmon Treaty coast-wide rebuilding program, as well as allocation guidelines established by the Alaska Board of Fisheries. Since 1989, the troll fleet has taken an average of 62% of the region's commercial coho salmon harvest. Other species harvested in the troll fishery are primarily taken incidentally, although pink and chum salmon have been targeted in a small spring fishery in Cross Sound, and in recent years hatchery chum salmon have been targeted in several areas in the region.

The vast majority of salmon production in the region is wild salmon, but hatchery releases contribute significantly to sockeye, coho, and Chinook salmon harvests and likely comprise the majority of the chum salmon harvest in some recent years.

Management of Southeast Alaska Salmon Fisheries

Management of salmon fisheries in Southeast Alaska is coordinated among six management areas, including Juneau, Ketchikan, Petersburg/Wrangell, Sitka, Haines, and Yakutat. Area management biologists responsible for managing net fisheries in their respective areas reside in these communities. Additionally, a seasonal office is maintained in Craig. The troll fishery is managed by a regional troll management biologist. Because of the spatial and temporal movement of fish and fishers between management areas, a regional management coordinator supervises the salmon managers to ensure a closely coordinated regional management approach for every fishery.

Because of the large number of stocks involved, the mixed stock and mixed species nature of the returns, and because several different gear groups harvest the same stocks of fish, management of the region's fisheries is extremely complex. Regulations approved by the Alaska Board of Fisheries provide specific guidance on fishing areas, seasons, gear, and domestic allocation among competing user groups. Since some salmon harvested in the region originate from other West

Coast and Pacific Northwest states, and Canada (including the Transboundary rivers), management of many of the region's fisheries are affected by terms of international treaties.

Inseason assessment of run strength is critical to management of all the region's salmon fisheries. A variety of data gathering programs are necessary to monitor incoming runs, including surveys of salmon abundance in terminal areas and streams, analysis of fishery performance data (i.e., catch per unit effort (CPUE)), test fishing in select areas, and stock identification information from major fisheries. The degree to which assessment and management programs provide accurate, detailed run projection information determines the amount of production surplus to escapement needs that can be harvested in fisheries.

PROPOSED PROJECTS

This document contains a list of projects proposed for increased funding. The projects described are either not conducted due to a lack of funding or are currently operated at levels insufficient to meet management objectives due to erosion of funding levels.

Projects are grouped into four categories (A – D) and are listed in Table 1. The categories are not prioritized, but the projects within each category are listed in order of priority. The first category (A) covers escapement-monitoring projects. Within this category, projects were ranked with priority given to projects that improve the department's abilities to ensure escapement goals are achieved and to provide for increasing surplus harvest opportunities, subject to the constraints created by the unpredictable environment. The second category (B) includes projects associated with catch and escapement sampling and run reconstruction. One project is proposed in this category, which increases funding for the region's salmon port sampling program. This program has been scaled back due to continual erosion of funding over many years. The third category (C) includes projects that directly improve salmon management. The last category (D) includes projects that support fisheries management. Included in this category for this year are improvements to the regional vessel support for the Sitka management area.

Table 1. Summary of proposed projects and estimated costs (thousands of dollars).

Project	First-Year Cost	Estimated Annual Continuing Cos s (Thousands)	Duration
A. Salmon Escapement Monitoring A.1. McDonald Lake Escapement Index Calibration A.2. Crescent Lake Sockeye Escapement Estimatio A.3. Sockeye Salmon Lake Stock Assessment A.4. Chilkat River Inseason Escapement Monitoring A.5 Hugh Smith Weir Upgrade A.6. Coho Salmon Escapement Surveys A.7. Early Taku Coho Salmon Assessment	\$300 \$85 \$250 \$90 \$27 \$57.0 \$17.0	\$60 \$70 \$250 \$90 \$57.0 \$17.0	Long Term Long Term Long Term Long Term 1 Year Long Term 4 Years
B. Catch and Escapement Sampling/Run Reconstruction B.1. Regionwide Port Sampling	\$170	\$170	Long Term
C. Salmon Fishery ManagementC.1. Assistant Troll BiologistC.2 Southeast Alaska Troll Chinook Salmon ManagementD. Management Support	\$55.0 \$8.0	\$55.0 \$8.0	Long Term 5 Years
D.1. Salmon and Herring Management Vessel	\$150.0	\$0.0	1 Year

A. Salmon Escapement Monitoring

The management of commercial salmon fisheries in Southeast Alaska depends heavily on inseason monitoring of salmon escapements to assess run strength. Harvest opportunities are allowed if and where salmon runs have a surplus to escapement needs. A large number of fisheries in the region are managed to harvest a share of the surplus of specific runs, according to Pacific Salmon Treaty agreements. To manage accordingly, the department must be capable of projecting escapement, catch, and total run for individual stocks or stock groups. Additionally, accurate monitoring of escapements is critical for understanding production characteristics and setting escapement goals for salmon populations.

A variety of escapement monitoring techniques are used in the region. Aerial surveys are the major assessment tool used to provide indices of escapements of pink and chum salmon and to manage commercial purse seine fisheries, which primarily target these species. Aerial surveys are also important for indexing escapement levels for select coho and sockeye salmon systems. Monitoring of Chinook salmon systems in Southeast Alaska is often based on helicopter surveys, which are usually conducted by the Division of Sport Fish. Reductions in general fund money and increasing fuel, insurance, and charter costs have resulted in a decrease in the number of streams monitored and frequency of aerial surveys in many areas. Operation of counting weirs in the region has declined in recent years due to budgetary limitations and the expense of such programs, despite the fact that in many cases weirs provide the most accurate estimates of escapement for clear water drainages, particularly for sockeye and coho salmon. Federal funding is currently supporting shortterm monitoring studies (2–3 years) of escapement at approximately 15 sockeye salmon systems in the region that are heavily utilized by subsistence fishers. Mark-recapture techniques are used to estimate escapements on several large glacial systems in the region. These studies are carried out cooperatively with other divisions and agencies using funding sources that are not long term in nature. An increase in general fund support of escapement monitoring projects in the region is needed and will result in improved management of Southeast Alaskan commercial salmon fisheries.

Project A.1. McDonald Lake DIDSON Escapement Estimation (sonar)

Location: McDonald Lake.

<u>Primary Objective:</u> Estimate the number of sockeye salmon spawning in the McDonald Lake system, and compare the estimate to an historical set of standardized series of foot-survey fish counts

<u>Description:</u> McDonald Lake is one of the largest producers of sockeye salmon in southern Southeast Alaska, although runs have greatly declined over the last three seasons. The escapement

goal averaged 82,000 since 1979, but in the last five years the average dropped to less than 54,000. Additionally, the escapement has fallen below the escapement goal three out of the last four years. McDonald Lake sockeye salmon have contributed significantly to commercial fisheries subject to Pacific Salmon Treaty harvest sharing agreements in Districts 101, 104 and 106. McDonald Lake sockeye salmon also support a popular terminal-area personal-use fishery at Yes Bay.

ADF&G biologists have generated approximate escapement estimates for McDonald Lake sockeye salmon annually since 1979. These estimates are based on the sum of foot-survey counts, calibrated to the escapement magnitude estimated with a weir in 1983 and 1984. Although these foot surveys probably do an adequate job of capturing escapement trends, the conversion to total escapement magnitude is questionable, at best.

The funds we are requesting would be used to install a modern scientific sonar system on this system, and measure to true escapement magnitude for several years. These estimates would then be used to recalibrate the foot-survey statistics.

DNA-based sockeye stock identification research currently underway may allow direct estimates of the contribution of McDonald Lake stocks to both Alaskan and Canadian fisheries. Documentation of the contribution of important Alaskan stocks will be critical in negotiating fair harvest sharing agreements. If the catch of McDonald Lake sockeye can be documented, accurate escapement estimates will be required to construct accurate run reconstructions, spawner-recruit relationships, and escapement goals.

We propose a two-year development project whereby we build a system for estimating sockeye escapement into McDonald Lake, we identify and fix shortcomings in that system, and we evaluate and describe shortcomings that can't be fixed. After two years of development this project will be moved into operational status

Duration: Three years.

Estimated Annual Cost: \$300,000 over 2 years, then \$60,000 per year after that.

Project B.2. Crescent Lake Sockeye Salmon Escapement Estimation

Location: Crescent Lake, Port Snettisham, Southeast Alaska.

<u>Primary Objective:</u> To provide inseason escapement estimates of sockeye salmon to Crescent Lake.

<u>Description:</u> Wild and hatchery management concerns in the Taku/Snettisham (District 111) gillnet fishery require timely and accurate estimates of the harvests and escapements of the principal contributing stocks of sockeye salmon. In the past, the department operated a weir on the outlet stream to Crescent Lake, one of the major sockeye salmon systems in Port Snettisham, but problems with high water and other factors rendered the weir ineffective in enumerating the return. Douglas Island Pink and Chum (DIPAC), the operators of the Snettisham Hatchery, acquired a

split-beam sonar system to monitor the escapement of salmon into Crescent Lake, and deployed the system for the first time in 2002. However, substantial technical details remain to be worked out, and this approach has not yet resulted an accurate, scientifically defendable escapement estimate. We are proposing to upgrade this project to a combined weir and mark-recapture project. We are asking for funding for weir materials, operating costs, and funding for annual planning and project documentation. Information from this project will improve management precision, create harvest opportunities on co-migrating stocks, and aid in development of escapement goals for this important sockeye salmon system.

Duration: A long-term stable funding source is desired.

First Year Cost (with materials): \$85,000.

Estimated Annual Cost: \$70,000.

Project B.3. Sockeye Salmon Lake Stock Assessment

Location: Entire Southeast Alaska area.

<u>Primary Objective:</u> To monitor escapement, terminal harvest, and lake productivity of selected sockeye salmon runs in Southeast Alaska.

<u>Description:</u> Many small sockeye salmon runs in the region support directed subsistence and sport fisheries and incidental commercial catches. Returns to few of these systems are intensively monitored due to a lack of state funding. Federal funding is currently supporting short-term studies (2–3 years) of escapement, terminal harvest, and lake productivity at approximately 15 of these systems. This project provides long-term funding for similar studies at several of the systems identified as presenting the most critical management and assessment challenges for the state.

<u>Duration:</u> This project is currently funded with short-term, Federal funding. A long-term stable funding source is desired.

Estimated Annual Cost: \$250,000.

Project A.4. Chilkat River Inseason Escapement Monitoring

Location: Chilkat River.

<u>Primary Objective:</u> To continue to monitor the inseason escapement of Pacific salmon into the Chilkat River drainage.

<u>Description</u>: The Chilkat River is one of the largest producers of Chinook, sockeye, coho and fall chum salmon in northern Southeast Alaska and contributes significantly to the commercial gillnet, troll and subsistence fisheries. Estimating the escapement of sockeye salmon and fall chum salmon

is done through mark-recapture techniques using fish wheels on the lower river for enumeration, tagging and collecting biological information. The fish wheels are also used as an inseason tool to estimate the abundance of returning adult Pacific salmon to the Chilkat River drainage. Additionally, the fish wheels serve as a platform for the collection of biological data on king and coho salmon, the recovery of coded wire tagged king and coho salmon, and the conducting of salmon radio tagging projects on the Chilkat River. Fish wheels have been used continually on the Chilkat River since 1994. Beginning in 2004, funding for the fish wheel project has been provided by the SSSF. This funding will continue through 2006, but long term funding has not been secured. Information collected from this project is critical for the decision making process in managing returns of Pacific salmon to the Chilkat River drainage.

<u>Duration</u>: We currently have short-term SSSF funding for this program. We would like a long-term funding source.

Estimated Annual Cost: \$90,000.

Project A.5. Hugh Smith Weir Upgrade

Location: Hugh Smith Lake

<u>Primary Objective:</u> To upgrade the weir at Hugh Smith Lake with an underwater digital video system to minimize handling fish.

Description: The Hugh Smith Lake sockeye stock was formally recognized by the Alaska Board of Fisheries in 2003 as a Stock of Concern. The Board and ADF&G developed an Action Plan to aid rebuilding of the stock. This plan includes harvest management actions, a lake-stocking program, and an intensive in-lake stock assessment program for Hugh Smith Lake sockeye salmon. We would like to use video technology for escapement monitoring to avoid as much handling as possible of fish from this depressed stock. Currently, we handle or impede every fish that passes into Hugh Smith Lake, which may cause undo stress. To minimize the effects of handling we would like to put a motion sensitive digital video system in place to allow free passage to fish through the weir. This would allow the fish to pass into Hugh Smith Lake unmolested and yet give us a reliable count of sockeye escapement. The video system we would also be able to measure every fish digitally using software and two lasers at fixed distances. With the upgrade in technology we would also like to be able to download data from the field with a small fixed dish Internet satellite connection. This equipment has already been successfully used in several locations in Alaska.

<u>Duration:</u> One year.

Estimated Annual Cost: \$27,000.

Project A.6. Coho Salmon Escapement Surveys

Location: Entire Southeast Alaska/Yakutat Area.

<u>Primary Objective</u>: To increase the number of streams in the Southeast Alaska/Yakutat region that are monitored for escapement of coho salmon.

<u>Description</u>: Several thousand streams produce coho salmon in Southeast Alaska, but only a few index systems are consistently monitored for escapement. This project would fund additional coho salmon escapement surveys in the Yakutat, Sitka, Petersburg, Juneau, and Prince of Wales areas, by using existing staff and extending employment for four technicians. The funds would be used to fill in important gaps in escapement information and to begin surveys on streams that are likely to be subjected to increasing harvest pressures from developing sport and new federal subsistence fisheries.

<u>Duration</u>: A long-term funding source is desired.

Estimated Annual Cost: \$57,000.

Project A.7. Early Taku Coho Salmon Assessment

Location: Taku River, British Columbia.

<u>Primary Objective:</u> To assess early run Taku River coho salmon spawning abundance, distribution, and juvenile habitat utilization.

Description: Early season returns of Taku River coho salmon in the last five years may have been lower than the prior decade, based on inriver and District 11 fishery performance and early season fishwheel counts. The earliest migrating Taku River coho salmon stocks enter the river from mid-July to mid-August and spawn in three main tributaries of the Nahlin River (i.e. upper Nahlin River, Dudidontu River, and Tseta Creek) during late-August to late-September. In 1986, the department initiated a program with Pacific Salmon Commission funds to identify the extent to which early runs existed in the Taku drainage, to determine their fishery distribution and exploitation rates, and to develop a baseline escapement index. Escapement surveys were conducted on the three Nahlin River tributaries in 1986 and were continued through 1991 in the upper Nahlin and Dudidontu Rivers, where physical conditions appeared excellent for obtaining comparable visual counts. The current proposal is for a project that will fund helicopter surveys of coho salmon escapement in tributaries of the Nahlin River in the upper Taku River drainage and minnow-trap surveys of the summer distribution of juvenile coho salmon in areas that are known to have been used by early coho salmon stocks. Locations that were previously surveyed will be revisited to determine if there has been an obvious change in the presence of juvenile coho salmon in the drainage, and new sites will be sampled to improve information on the distribution and use by juveniles. The findings will be compared with escapement counts and observations on the distribution of adults and rearing juveniles during 1986-1991. In addition to an assessment of the

level of escapement and the distribution of juveniles relative to the baseline period, another purpose of the surveys is to document changes in access by spawners to habitat within the system.

Duration: Four years.

Estimated Annual Cost: \$17,000.

B. Catch and Escapement Sampling/Run Reconstruction

Thousands of salmon runs contribute to salmon harvests in Southeast Alaska. Commercial salmon harvests are sampled for a wide variety of biological data that is necessary for effective resource management and research activities in the region. Catches are sampled for age, sex, and size information, for a variety of data used for stock composition studies (scales, otoliths, presence of coded wire tags, presence of parasites, and genetics samples), for troll fishery performance data, for pink salmon sex ratio data used to determine run timing, and for a variety of other information. Select salmon escapements are sampled for age, sex, and size information and other biological characteristics. Thorough understanding of stock compositions of harvests is necessary to allow accurate run reconstruction, develop better understanding of stock-specific productivity, establish and improve escapement goals, monitor international harvest sharing agreements, and assess effects of management actions.

Most funding for catch and escapement sampling programs in Southeast Alaska comes from federal sources. Funding levels have largely remained static, while costs have risen and increased demands have been placed on the program. The following project is needed to maintain the existing catch and escapement sampling program and improve stock identification information needed for Pacific Salmon Treaty compliance.

Project B.1. Regionwide Port Sampling

Location: Entire Southeast Alaska/Yakutat area.

<u>Primary Objective:</u> To collect biological information from salmon harvests in the Southeast Alaska/Yakutat area.

<u>Description:</u> The Southeast Alaska port sampling project samples commercial landings at all major ports and processors in the region. The sampling program provides research and management support, and includes sampling for coded wire tags (over one million fish sampled annually), scales (approximately 225,000 fish sampled annually and used to estimate stock composition of sockeye salmon harvests), troll catch-per-unit effort and pink salmon sex ratios. Over the years, employee costs have increased, but budgets have remained static and demands on the sampling programs have increased. Some sampling programs have been reduced or eliminated and what

remains is required for management and research support. Furthermore, labor-intensive matched sampling is now common. In order to meet sampling goals for the existing program additional personnel are needed. This project adds an additional seasonal fisheries technician sampler for each of the ports of Ketchikan, Petersburg, Sitka, and Juneau, adds funding for spring troll sampling, and adds some time for a project biologist to assist with the project administration.

Duration: A long-term stable funding source is desired.

Estimated Cost: \$170,000.

C. Salmon Fishery Management

Project C.1. Assistant Troll Fishery Management Biologist

Location: Juneau, Alaska.

<u>Primary Objective:</u> Provide additional management support for the Southeast Alaska salmon troll fishery.

<u>Description:</u> Historically one Regional Troll Biologist and two assistant biologists have managed this complex fishery. One of the assistant positions was cut because stable/declining funding from the Federal Pacific Salmon Commission grant has been insufficient to cover the costs of inflation. The loss of this position will limit the department's ability to make inseason management decisions, particularly in the spring troll season, and reduce the degree of public interaction and support for industry. The loss of this position may also have negative implications in managing the troll fishery in accordance with provisions of the Pacific Salmon Treaty. In addition, completion of annual reporting requirements related to this fishery and support during Alaska Board of Fisheries meetings will be negatively impacted.

<u>Duration:</u> Long term.

Estimated Annual Cost: \$55,000.

Project C.2. Southeast Alaska Troll Chinook Salmon Management

Location: All of Southeast Alaska.

<u>Primary Objective:</u> Provide better in-season estimates of Chinook salmon catch rates, which would be particularly helpful during "low" abundance years and would enable the department to more accurately achieve Chinook salmon troll harvest allocations mandated by the Alaska Board of Fisheries and Pacific Salmon Treaty.

<u>Description:</u> This three-year project would enable regional troll staff to conduct on-the-grounds vessel interviews along the outside coast from Yakobi Island to approximately Whale Bay during the first Chinook summer retention period. The timing of this survey would be approximately July 2-4 annually.

<u>Duration:</u> 5 years.

Estimated Annual Cost: \$8.0.

D. Management Support

Effective inseason management of commercial fisheries requires a wide variety of information be available to fishery managers. Projects proposed in this section will improve managers' rapid access to biological information databases, fund analyses to provide the best quantitative escapement goals for managers to target, and improve field programs to ensure the requisite inseason information is collected on a timely basis.

Project D.1. Salmon and Herring Management Vessel

Location: Sitka, Baranof Island, Southeast Alaska.

Primary Objective: To improve vessel support for Sitka area fisheries management.

<u>Description</u>: The *M/V O'Kisutch* is one of a small fleet of 32' fiberglass vessels purchased new for the department around the time of statehood. This vessel is still in use and supports a crew of two field technicians out of the Sitka office during salmon and herring seasons. The vessel is primarily used during summer months to transport and house field technicians who conduct pink and chum salmon surveys on marine and fresh waters, observe and interview purse seine fishers during fisheries, and place regulatory markers prior to open fishing periods. The information gathered is vital to the effective management of purse seine fisheries around the Sitka area. The vessel is old and underpowered, with a top speed of 7 knots, and valuable time is often lost in traveling and waiting for tidal currents to slack. The consequence is that not all of the management area can be surveyed on an inseason basis. Replacing this vessel is the most cost-effective means of providing adequate coverage and extending the effective range of the Sitka field crew.

Duration: One year.

Estimated Annual Cost: \$150,000 for one year.

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